REMARKS

Claims 1-18 remain pending in the application, with Claims 1, 5-10 and 14-18 being the independent claims. Claims 5, 6, 9, 14, 15 and 18 are rejected under 35 U.S.C. § 102(e) as allegedly being unpatentable over newly cited Baker (U.S. Patent No. 6,163,563). Claims 1-4 and 10-13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Baker in view of Johnston (U.S. Patent No. 5,481,614). Claims 7 and 16 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over newly cited Bender (U.S. Patent Application Publication No. 2003/0112774 A1) in view of newly cited Ghosh (U.S. Patent No. 6,366,601 B1). Claims 8 and 17 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Baker in view of Ghosh.

Applicants appreciate the courtesies extended to Applicants' representative during the telephonic interview held September 10, 2007. The present response summarizes the substance of the interview. During the interview Applicants' representative discussed the application of Baker and Johnston to Claims 1-6, 9-15 and 18, and particularly the reliance on col. 9, lines 37-42 of Baker for satisfying the modulator or modulating step recited in Claims 5, 6, 9, 14, 15 and 18; the application of Bender and Ghosh, and particularly the reliance on col. 2, lines 39-44 of Ghosh for satisfying the "according to an information bit" recitation of Claims 7 and 16; and the failure of the Examiner to comply with the principles of compact prosecution in the present application. The Examiner agreed that Ghosh did not satisfy the recitations of Claims 7 and 16 and additionally stated that the next Office Action would not be final. A formal agreement as to the patentability of the claims was withheld by the Examiner pending a thorough review of arguments presented at the interview, a thorough review of this response, and a further update search.

It is respectfully submitted that the Examiner has demonstratively failed to comply with the principles of compact prosecution in the present application. The present application was filed October 22, 2001. A first Office Action was mailed on May 2, 2005 including certain grounds of rejection based on references listed in PTO forms 1449 and 892 attached to the Office Action. A response to the May 2, 2005 Office Action was filed August 25, 2005. A second

Office Action was mailed October 14, 2005 including new grounds of rejection based on additional references listed in an attached PTO form 892. A response to the October 14, 2005 Office Action was filed February 14, 2006. A third Office Action was mailed on May 17, 2006 including new grounds of rejection based on additional references listed in an attached PTO form 892. A response to the May 17, 2006 was filed August 17, 2006. A fourth Office Action was mailed November 15, 2006. A Request for Continued Examination was filed March 15, 2007 with a Submission. A fifth Office Action was mailed on May 14, 2006 including new grounds of rejection based on additional references listed in an attached PTO form 892. The PTO form 892 attached to the May 14, 2007 Office Action lists additional references that should have been included on the PTO form 892 attached to the first Office Action of May 2, 2005.

By mailing out five different Office Actions including various different grounds of rejection, the Examiner has failed to conduct a proper examination of the present application.

The present invention relates to an apparatus and method for transmitting a burst pilot channel in a mobile communication system.

The burst pilot channel of the present invention transmits transmission data, which is modulated and spread according to a phase, a complex channel, and an orthogonal code, thereby transmitting side information included in the transmission data together with the transmission data. In brief, side information of the present invention is dependent on transmission data is a modulation scheme (a phase/a complex channel) or orthogonal code itself, which is used for modulated and spread pilot symbol to be transmitted.

Baker describes a digital communication system for high-speed complex correlation. Johnston describes a method and apparatus for coding audio signals based on a perceptual model. Bender describes a method and apparatus for signal combining in a high data rate communication system. Ghosh describes a variable rate spread spectrum communication method and apparatus.

The Examiner states that Baker discloses all of the recitations in Claims 5, 6, 9, 14, 15 and 18. With respect to Claims 1-4 and 10-13, the Examiner concedes that Baker fails to disclose the burst pilot channel transmits side information being dependent on the transmission data according to at least one of the phase, and the complex channel and the orthogonal code. The Examiner states that Johnston discloses these recitations, and asserts that it would have been obvious to incorporate the alleged suggestions of Johnston into Baker. With respect to Claims 7 and 16, the Examiner concedes that Bender fails to disclose a modulator, a spreader, and the information bit recitations of Claims 7 and 16. The Examiner states that Ghosh discloses these recitations, and asserts that it would have been obvious to incorporate the alleged suggestions of Ghosh into Bender.

Independent Claim 1 recites, in part, a modulator for generating a modulated pilot symbol by outputting an input pilot channel data at at least one of a designated phase and on a designated complex channel according to an information bit of the transmission data for designating at least one of the phase and the complex channel. Independent Claim 5 recites, in part, a modulator for generating a modulated pilot symbol by outputting an input pilot channel data at a designated phase according to an information bit of the transmission data for determining the phase. Independent Claims 6 and 9 each recite, in part, a modulator for generating a modulated pilot symbol by outputting an input pilot channel data at a designated complex channel according to an information bit of the transmission data for determining the complex channel. Independent Claim 14 recites, in part, generating a modulated pilot symbol by outputting an input pilot symbol at a designated phase according to an information bit of the transmission data for determining the phase. Independent Claims 15 and 18 each recite, in part, generating a modulated pilot symbol by outputting an input pilot symbol on a designated complex channel according to an information bit of the transmission data for determining the complex channel.

The Examiner relies on Baker, col. 9, lines 37-42, for satisfying the modulator or modulating step recited in associated Claims 1, 5, 6, 9, 14, 15 and 18. The Baker disclosure relates to a technique useful in a receiver for correlating a generated, known sequence with received signal samples to determine the received signal samples in a multi-chip data sequence.

Baker shows a communication system 20 in FIG. 1 for carrying out the Baker invention. The communication system 20 includes a rake receiver correlation unit 60. The rake receiver correlation unit 60 receives a sampled in-phase signal 50 and a sampled quadrature phase signal 52. The rake receiver correlation unit 60 also receives a digital in-phase signal 62, a digital quadrature signal 64, and a timing signal 66 extracted from the received data. The rake receiver correlation unit 60 processes the inputs it receives and outputs soft data bits 86 extracted from the signature sequence.

In FIG. 2, Baker shows an overview of a rake receiver according to the Baker invention. The rake receiver shown in FIG. 2 includes a reference sequence register 116. Reference sequence register contains both the in-phase and quadrature reference sequences. Each bit of the in-phase and quadrature sequence is either a plus one or a minus one. The Nyquist rate for the complex signal is one sample per chip for each in-phase term and quadrature term. The quadrature term is the negative complex conjugate of the in-phase term.

Upon start-up, the in-phase components of the reference sequence are provided as parallel inputs to a first shift register and the quadrature components of the reference sequence are provided as parallel inputs to a second shift register. The in-phase and quadrature reference sequences are circularly shifted, respectively, by the first and second shift registers. New complex samples overwrite the oldest complex samples in memory 104 and the correlation is evaluated only when the reference vector alignment register 155 is properly positioned.

First and second tracking correlation reference vector generators 166 and 168 are shown in FIG. 3 of Baker. The vector generators 166 and 168 generate vectors for early, on-time, and late correlations. In a soft hand-off mode, two base station cells must be monitored. Circular address generator 170 identifies a location of memory 172 where the new data is written. Baker generally describes modulation in col. 9, lines 29-32, where Baker describes how the data input to memory 166 is the complex pilot sequence modulated exclusive-ORed with a 64-chip Walsh sequence in a repetitive manner to mirror the transmit process for a particular Walsh channel.

Baker also describes, in col. 9, lines 33-42, how the modulated pilot epoch in-phase and quadrature sequence are provided in parallel to circular shift register 176, circular shift register 176 provides the in-phase and quadrature modulated pilot sequence to multiplexers 178, multiplexers 178 select either the in-phase or quadrature modulated pilot sequence vectors as inputs to adder 162 alternately with multiplexers 158, and adder 162 performs a correlation and provides output 164.

Baker nowhere describes or reasonably suggests, in these areas or any other areas, a modulator for generating a modulated pilot symbol by outputting an input pilot channel data at at least one of a designated phase and on a designated complex channel according to an information bit of the transmission data for designating at least one of the phase and the complex channel, a modulator for generating a modulated pilot symbol by outputting an input pilot channel data at a designated phase according to an information bit of the transmission data for determining the phase, a modulator for generating a modulated pilot symbol by outputting an input pilot channel data at a designated complex channel according to an information bit of the transmission data for determining the complex channel, a process step of generating a modulated pilot symbol by outputting an input pilot symbol at a designated phase according to an information bit of the transmission data for determining the phase, or a process step of generating a modulated pilot symbol by outputting an input pilot symbol on a designated complex channel according to an information bit of the transmission data for determining the complex channel, as erroneously purported by the Examiner.

Baker fails to teach or reasonably suggest a burst pilot channel which transmits side information being dependent on the transmission data according to at least one of the phase, the complex channel, and the orthogonal code, which is designated according to an information bit of the transmission data. In particular, Baker includes no discussion of generating a modulated pilot symbol or modulating a pilot symbol according to an information bit of the transmission data. Johnston fails to disclose any method or apparatus for transmitting side information through a burst pilot channel. Johnston fails to supplement the deficiencies of Baker.

In contrast, the present invention includes generating a modulated pilot signal according to an information bit of the transmission data.

With respect to Claims 7 and 16, the Examiner concedes that Bender fails to disclose a modulator, a spreader, and the information bit recitations of Claims 7 and 16. The Examiner states that Ghosh discloses these recitations, and asserts that it would have been obvious to incorporate the alleged suggestions of Ghosh into Bender.

Bender describes a method and apparatus for signal combining in a high data rate communication system. Ghosh describes a variable rate spread spectrum communication method and apparatus.

The Examiner relies on paragraph 37 of Bender for satisfying the modulator and spreader recited in Claims 7 and 16. In paragraph 37, Bender merely discloses that the pilot burst has forward link traffic data and overhead bits, but nowhere suggests side information or a method for transmitting the same.

The Examiner relies on col. 2, lines 39-44 of Ghosh to satisfy the recited "according to an information bit" recitation of Claims 7 and 16. In these lines, Ghosh merely discuses that when a whole number of data bits is larger than the number of the plurality of spreading codes, at least one of the at least two packets of data is scheduled for a subsequent transmission. Ghosh also describes how at least one of the non-selected of the at least two packets of data is used for determining the number of data bits. Ghosh says nothing about generating a modulated pilot signal according to an information bit of the transmission data in these lines. In addition, Ghosh fails to supplement the deficiencies of Bender because Ghosh nowhere suggests side information or a method for transmitting the same.

In col. 3, lines 31-47, Ghosh describes how the modulation-coding scheme selected at the encoder/modulator 107 includes modulation according to a quadrature amplitude modulation level and coding according to the coding rate. The coding rate may be selected from a plurality

of turbo encoding rates 110 available in the communication system. Bender, Ghosh, or any combination thereof, says nothing anywhere about generating a modulated pilot signal according to an information bit of the transmission data in these lines.

The Examiner has failed to establish a *prima facie* case of anticipation or obviousness for at least these reasons.

More particularly, Baker, Johnston, Bender, Ghosh, or any combination thereof, fails to teach or reasonably suggest <u>a modulator for generating a modulated pilot symbol by outputting an input pilot channel data at at least one of a designated phase and on a designated complex channel according to an information bit of the transmission data for designating at least one of the phase and the complex channel</u>, as recited in Claim 1; <u>a modulator for generating a modulated pilot symbol by outputting an input pilot channel data at a designated phase according to an information bit of the transmission data for determining the phase</u>, as recited in Claim 5, <u>a modulator for generating a modulated pilot symbol by outputting an input pilot channel data at a designated complex channel according to an information bit of the transmission data for determining the complex channel</u>, as recited in Claims 6 and 9, <u>generating a modulated pilot symbol by outputting an input pilot symbol at a designated phase according to an information bit of the transmission data for determining the phase</u>, as recited in Claim 14, and <u>generating a modulated pilot symbol by outputting an input pilot symbol on a designated complex channel according to an information bit of the transmission data for determining the complex channel</u>, as recited in Claims 15 and 18.

Accordingly, independent Claims 1, 5-10 and 14-18 are allowable over Baker, Johnston, Bender, Ghosh, or any combination thereof.

While not conceding the patentability of the dependent claims, *per se*, Claims 2-4 and 11-13 are also allowable over Baker, Johnston, Bender, Ghosh, or any combination thereof, for at least the above reasons.

Accordingly, all of the claims pending in the Application, namely, Claims 1-18, are in condition for allowance. Should the Examiner believe that a telephone conference or personal interview would facilitate resolution of any remaining matters, the Examiner may contact Applicants' attorney at the number given below.

Respectfully submitted,

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